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1 of 2

Mr. John Grantham
State of Washington
Department of Ecology
Nuclear & Mixed Waste Program
P. O. Box 47600
Olympia, WA 98504-7600

FLUOR DANIEL, INC.

Date: February 26, 1993

Reference: Hanford Waste Vitrification Plant
DOE Contract DE-AC06-86RL10838
Fluor Contract 8457

Transmittal No.: WDOE-341

Dear Mr. Grantham:

TRANSMITTAL

We enclose * copy of the items listed below. These are issued per US-DOE request.
*2 FULLSIZE BLUELINES ROLLED & 2 SPECIFICATIONS, & 1 REDUCED

Response due to Fluor: N/A
Responds to: B210A PACKAGE

NUMBER	REV	DATE	TITLE
SEE TRANSMITTAL ATTACHMENT	----	----	B210A VIT BUILDING FOUNDATION PACKAGE

Distribution:

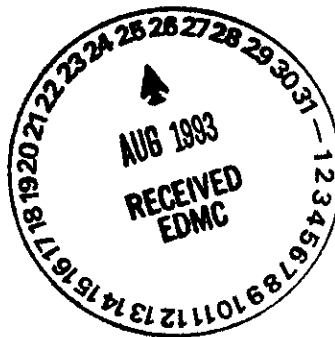
Reference: FRP-805, FUP-376
R. L. Long: DOE-RL w/0
TWP/AME Corresp Cntrl Cntr, MSIN A5-10
(B210A PACKAGE), w/0
P. Felise, WHC-RL (MSIN G6-16), w/1F, 1 SPEC
Environmental Data Management Center
(MSIN H6-08), w/1F, 1 SPEC
D. Duncan, US EPA, Region X w/0

Very truly yours,

R. S. Poulter
R. S. Poulter
Project Director

RSP:PP:lt

PP



9413201.0170

TRANSMITTAL ATTACHMENT FOR PACKAGE DRAWINGS

PACKAGE NUMBER: B210A

DRAWING NUMBER	SHT	NO.	REV	DATE	DRAWING TITLE
H-2-117431	1	1		02/25/93	STRUC T VIT BLDG TUNNEL FORMING PLAN SOUTH END
H-2-117432	1	1		02/25/93	STRUC T VIT BLDG TUNNEL FORMING PLAN NORTH END
H-2-117438	1	1		02/25/93	STRUC T VIT BLDG TUNNEL MAT REINF PLAN NORTH END TOP REINF
H-2-117442	1	1		02/25/93	STRUC TURAL VIT BLDG TUNNEL FLOOR PLAN
H-2-117452	1	1		02/25/93	STRUC TURAL VIT BLDG TUNNEL FLOOR PLAN
H-2-117454	1	1		02/25/93	STRUC TURAL VIT BLDG TUNNEL FLOOR PLAN
H-2-117953	2	0		02/25/93	STRUC TURAL VIT BLDG WALL ELEVATIONS
H-2-117966	1	1		02/25/93	STRUC TURAL VIT BLDG WALL ELEVATIONS
H-2-118226	1	1		02/25/93	STRUC T VIT BLDG REINF SECTS CA, CB, CC, CD, CE, & CF
H-2-118231	1	1		02/25/93	STRUC TURAL VIT BLDG SECTIONS & DETAILS
H-2-118235	1	1		02/25/93	STRUC TURAL VIT BLDG SS SUMPS
H-2-118235	2	1		02/25/93	STRUC TURAL VIT BLDG SS SUMPS
H-2-118235	3	1		02/25/93	STRUC TURAL VIT BLDG SS SUMPS
H-2-118235	4	1		02/25/93	STRUC TURAL VIT BLDG SS SUMPS
H-2-118240	1	1		02/25/93	STRUC TURAL VIT BLDG INSERT PL SCHED & DETS
H-2-118249	1	1		02/25/93	STRUC TURAL VIT BLDG SECTIONS & DETAILS
H-2-118250	1	1		02/25/93	STRUC T VIT BLDG RAILROAD DOOR EMBEDS SECTIONS & DETAILS
H-2-116005	1	1		02/25/93	VIT BUILDING FOUNDATION TITLE SHEET
H-2-116006	1	1		02/25/93	VIT BUILDING FOUNDATION DRAWING INDEX
H-2-116006	2	1		02/25/93	VIT BUILDING FOUNDATION DRAWING INDEX
H-2-124092	1	1		02/25/93	PIPING VIT BUILDING TUNNEL SLAB LEVEL DRAWING INDEX
H-2-124094	1	1		02/25/93	PIPING PLAN VIT BUILDING AREA S-A-1 AND S-A-2
H-2-124095	1	1		02/25/93	PIPING PLAN VIT BUILDING AREA S-B-1 THRU S-B-3
H-2-126175	8	0		02/25/93	PE-3"-110-017-DD-1h SHEET 01 PIPING ISOMETRIC
H-2-126176	16	0		02/25/93	PE-2"-20C-203-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126176	5	0		02/25/93	PE-2"-20B-065-DE-NONE SHEET 01 PIPING ISOMETRIC
H-2-126176	21	0		02/25/93	PE-2"-20C-204-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126177	22	0		02/25/93	PE-2"-20C-195-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126178	14	0		02/25/93	PE-2"-20C-197-A-NONE SHEET 01 PIPING ISOMETRIC

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PACKAGE NUMBER: B210A

<u>DRAWING NUMBER</u>	<u>SHT NO.</u>	<u>REV</u>	<u>DATE</u>	<u>DRAWING TITLE</u>
H-2-126178	17	0	02/25/93	PE-2"-20C-193-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126179	15	0	02/25/93	PE-2"-20C-196-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126179	16	0	02/25/93	PE-2"-20C-194-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126180	16	0	02/25/93	PE-2"-20C-199-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126185	3	0	02/25/93	PE-3" 110-002-DD-NONE SHEET 01 PIPING ISOMETRIC
H-2-126185	22	0	02/25/93	PE-2"-20C-202-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126185	23	0	02/25/93	PE-2"-20C-200-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126186	3	0	02/25/93	PE-3"-110-014-DD-Ih SHEET 01 PIPING ISOMETRIC
H-2-126186	20	0	02/25/93	PE-2"-20C-201-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-126187	9	0	02/25/93	PE-3"-110-038-DD-Ih SHEET 01 PIPING ISOMETRIC
H-2-126188	6	0	02/25/93	PE-2"-20B-064-DE-NONE SHEET 01 PIPING ISOMETRIC
H-2-126188	18	0	02/25/93	PE-2"-20C-198-A-NONE SHEET 01 PIPING ISOMETRIC
H-2-122381	1	1	02/25/93	ELECTRICAL VIT BLDG STANDARD DRAFTING SYMBOLS
H-2-122381	2	1	02/25/93	ELECTRICAL VIT BLDG STANDARD ABBREVIATIONS AND GENERAL NOTES
H-2-122382	1	1	02/25/93	ELECTRICAL VIT BLDG STANDARD ASSEMBLIES
H-2-122382	2	1	02/25/93	ELECTRICAL VIT BLDG STANDARD DETAILS
H-2-122383	1	1	02/25/93	ELECTRICAL VIT BLDG UNDERGROUND CONDUIT & GROUNDING PLAN
H-2-122383	2	1	02/25/93	ELECTRICAL VIT BLDG UNDERGROUND CONDUIT & GROUNDING PLAN
H-2-122383	3	1	02/25/93	ELECTRICAL VIT BLDG UNDERGROUND CONDUIT & GROUNDING PLAN
H-2-122383	4	1	02/25/93	ELECTRICAL VIT BLDG UNDERGROUND CONDUIT & GROUNDING PLAN
H-2-122384	1	1	02/25/93	ELECTRICAL VIT BLDG UNDERGROUND & GROUNDING SECTIONS
H-2-122384	2	1	02/25/93	ELECTRICAL VIT BLDG UNDERGROUND & GROUNDING SECTIONS
H-2-122384	3	1	02/25/93	ELECTRICAL VIT BLDG UNDERGROUND & GROUNDING SECTIONS

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TRANSMITTAL ATTACHMENT FOR PACKAGE SPECIFICATIONS

<u>SPEC NUMBER</u>	<u>PKG SIGN DATE</u>	<u>PKG REV</u>	<u>SECT REV</u>	<u>SECTION DATE</u>	<u>SECTION</u>	<u>SECTION TITLE</u>
B-595-C-B210A	B210A	1			VITRIFICATION BUILDING FOUNDATION	
	02/25/93		1		15062	PIPING MATERIAL, FABRICATION, ERECTION & PRESS TESTING SPEC (DOUBLE CONTAINED PIPING)
	02/25/93		1		16100	ELECTRICAL INSTALLATION
	02/25/93		1		16110	ELECTRICAL MATERIAL AND DEVICES
	02/25/93		0		RD-1	RELATED DOCUMENT NO. 1 PIPING ISOMETRICS RD-1

VITRIFICATION BUILDING FOUNDATION
SPECIFICATION B-595-C-B210A

APPROVED FOR CONSTRUCTION

Revision 1 PER CR-0929

Issue Date 2/25/93

APPROVED BY:

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J. G. Kelly Quality Assurance Manager

R. S. Poulter
R. S. Poulter Project Director

2/25/93
Date

2/25/93
Date

2/25/93
Date

2/25/93
Date

2/25/93
Date

2/25/93
Date

2/25/93
Date

FEB 26 1993

VITRIFICATION BUILDING FOUNDATION
B-595-C-B210A

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DIVISION 2 - SITE WORK

Section	Title	
02220	Excavation and Backfill	0

DIVISION 3 - CONCRETE

Section	Title	
03200	Concrete Reinforcement	0
03252	Concrete Anchors	0
03300	Cast-in-Place Concrete	0
03010	Metallic Topping	0

DIVISION 5 - METALS

Section	Title	
05059	Welding Stainless Steel Liners	0
05062	Welding Piping	0
05123	Miscellaneous Metals	0
05560	Embedded Wall Penetrations	0

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section	Title	
07160	Bituminous Dampproofing	0

DIVISION 9 - FINISHES

Section	Title	
09875	Priming of Steel	0

DIVISION 13 - SPECIAL CONSTRUCTION

Section	Title	
13252	Precautions for Fabrication, Handling and Storage of Stainless Steel and Nickel Alloys	0

DIVISION 15 - MECHANICAL

Section	Title	
RD-1	Piping Isometrics	1
15196	Identification and Tagging Methods for Mechanical Equipment	0
15060	Piping Material, Fabrication, Erection and Pressure Testing (Alloy Piping)	0
15062	Piping Material, Fabrication, Erection and Pressure Testing (Double Contained Piping)	1
*15250	Mechanical Insulation	C

DIVISION 16 - ELECTRICAL

Section	Title	
16100	Electrical Installation	1
16110	Electrical Material and Devices	1
16111	Conduit Schedule	D
16905	Electrical Testing	D

* Submitted as Reference Document

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION 16100
ELECTRICAL INSTALLATION
B-595-C-B210A-16100

APPROVED FOR CONSTRUCTION

REVISION 1 PER CR-0690 & CR-0929
ISSUE DATE 2/25/93

WAPA YES ☐ NO ☒
QUALITY LEVEL I ☐ II ☒
SAFETY CLASS 1 ☐ 2 ☐ 3 ☒ 4 ☐

ORIGINATOR:

CHECKER:

Charles C Simpson 2-25-93
C. C. Simpson, Electrical Engineer Date

A. Larsen 2-25-93
A. Larsen, Electrical Engineer Date

APPROVED BY:

K. A. Owrey
K. A. Owrey Lead Discipline Engineer

2-25-93
Date

SECTION 16100
ELECTRICAL INSTALLATION
B-595-C-B210A-16100

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**SECTION 16100
ELECTRICAL INSTALLATION**

PART 1 GENERAL

1.1 SUMMARY

- 1.1.1 This specification defines the technical requirements for installation of electrical materials and devices in the Vitrification Building foundation.
- 1.1.2 Seller shall furnish all labor, material, tools, and equipment necessary to perform installation of wall embedments, underground duct banks and grounding system for the Vitrification Building foundation package as shown on the Contract Drawings and in accordance with the requirements of this section.
- 1.1.3 Seller shall be responsible for electrical installation and field routing of conduit and grounding system where not specifically defined on the Contract Drawings.
- 1.1.4 Seller shall provide and install locknuts, union fittings, caps, plugs, and hardware, etc., as required to complete the installation per the Contract Drawings.
- 1.1.5 Dimensional tolerance shall be ± 1 inch unless otherwise specified on the Contract Drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 1990 National Electrical Code (NEC)

1.3 RELATED REQUIREMENTS

Specification Section 16110 Electrical Materials and Devices

Specification Section 16111 Conduit Schedule

Specification Section 16905 Electrical Testing

1.4 **DEFINITIONS**

(Not Used)

1.5 **SYSTEM DESCRIPTION**

(Not Used)

1.6 **SUBMITTALS**

1.6.1 Submit the following in accordance with the Vendor Drawing and Data Requirements section of the subcontract.

A. As-Built Drawings

1.7 **CLASSIFICATION OF SYSTEM AND COMPONENTS**

(Not Used)

1.8 **PROJECT OR SITE ENVIRONMENTAL CONDITIONS**

1.8.1 Climatic and Geographic Site Conditions

A. Site Elevation 714 feet above sea level

B. Barometric Pressure 14.3 psia

C. Outside Design Temperature

1) Maximum Design Temperature 110°F

2) Minimum Design Temperature -20°F

PART 2 PRODUCTS

2.1 **MATERIALS AND EQUIPMENT**

2.1.1 Seller shall install all materials including grounding system, underground duct banks, wall embeds and conduit stub-ups required to complete electrical installation in accordance with the Contract Drawings and specification sections.

2.1.2 Electrical material and devices shall be in accordance with Specification Section 16110, Electrical Materials and Devices.

2.2 **FABRICATION AND MANUFACTURE**

(Not Used)

PART 3 EXECUTION

3.1 INSTALLATION, APPLICATION AND ERECTION

3.1.1 Materials and devices shall be installed in accordance with NFPA 70, the Contract Drawings and manufacturer's instructions.

3.1.2 Conduit

3.1.2.1 Conduits installed below grade shall be polyvinyl chloride (PVC) Schedule 80 or rigid steel galvanized conduit as noted on the Contract Drawings.

3.1.2.2 Rigid steel galvanized conduit shall be cut square with a conduit cutter and threaded with a conduit threader. The ends shall be reamed of burrs and all metal shavings and cutting lubricants shall be removed before the conduit is connected to the conduit system.

3.1.2.3 Stainless steel conduits shall be cut square with a conduit cutter.

3.1.2.4 Electrical embeds shall be stainless steel conduit.

3.1.2.5 Conduit crushed or deformed in bending will be rejected. Concentric bends are not required; however, the Seller shall maintain identical spacing between adjacent conduit runs both at the beginning and after the bend.

3.1.2.6 Supports shall be erected square, and true to line and grade, with a minimum spacing of one support for every 10 feet of conduit length.

3.1.2.7 Conduit openings into which dirt, mortar mix or debris may fall shall be closed with caps or plugs during the construction period. Conduits in which such material has accumulated shall be thoroughly cleaned. Where such accumulations cannot be readily removed, the conduit shall be replaced.

3.1.2.8 When not shown in detail on the Contract Drawings or when an installation interference exists, the exact locations and routing of conduit shall be determined by the Seller and approved by the Buyer.

3.1.2.9 Fittings on conduit systems having threaded connections shall be made up tight, with full thread engagement, and with a minimum of wrench work in order to avoid wrench cuts. Running threads and slip joints are not permitted. Joints shall provide structural rigidity and low electrical resistance.

- 3.1.2.10 Before making up conduit runs, the interiors of all conduit, conduit bends and fittings shall be inspected and cleaned of all dirt, cuttings and other foreign material.
- 3.1.2.11 Conduit threads shall be continuous and shall be made with appropriate tooling.
- 3.1.2.12 Rigid steel field cut threads shall have anti-siege compound. The application of the coating shall overlap the unthreaded conduit by one inch all around.
- 3.1.2.13 Wall embedded conduits shall be installed with the largest symmetrical bending radius permitted as noted on the Contract Drawings. The entry and exit conduit penetrations shall be 90°/perpendicular to the wall.
- 3.1.3 Conduit and Hardware Supports
 - 3.1.3.1 Conduit supports shall be furnished and installed by the Seller as required by National Electrical Code and as shown on the Contract Drawings.
- 3.1.4 Identification
 - 3.1.4.1 Conduits
 - 3.1.4.1.1 Embeds and conduits listed on Specification Section 16111, Conduit Schedule, shall be identified in accordance with Specification Section 16110.
 - 3.1.4.1.2 Embeds shall be identified at both sides of any walls. Conduit stub-ups/stub-outs shall be identified as shown on the Contract Drawings.
- 3.1.5 Grounding
 - 3.1.5.1 The grounding system including underground duct banks, ground rods, embedded ground plates, single point instrument ground, etc., shall be in accordance with the Contract Drawings. In addition to the grounding specified herein or on the Contract Drawings, all ground connections required by the National Electrical Code shall be furnished and installed.
 - 3.1.5.2 Grounding conductors shall be copper. Routing shall be as shown on the Contract Drawings.
 - 3.1.5.3 Before connections are made, all contact surfaces shall be clean of grease, dirt and debris. Apply approved anti-oxidizing compound as specified in Section 16110 to clean contact surfaces connections.

3.1.5.4 Exothermic weld connections shall be made by the Cadweld process or equal. Grounding connections shall include but not be limited to, all cable to cable splices, tees, X's, cable to ground rods, copper to steel or cast iron and cable lug terminations as shown on the Contract Drawings.

3.1.5.5 Building rebar shall be grounded as shown on the Contract Drawings.

3.1.6 Single Point Instrument Grounding

3.1.6.1 Single point instrument grounding shall be a separate and isolated grounding system. The insulated copper conductor shall be run in PVC conduit and stubup shall be in rigid steel conduit. Routing shall be as shown on the Contract Drawings.

3.1.7 Underground Duct Banks

3.1.7.1 Underground duct banks shall consist of rigid steel galvanized conduit, PVC conduit and ground wire encased in concrete as shown on the Contract Drawings. Joints in conduit shall be water-tight.

3.1.7.2 Minimum depth to top of duct banks shall be 2'-6" except as noted on the Contract Drawings.

3.1.7.3 After underground conduit runs have been completed, pull a test mandrel and wire brush through each conduit to check alignment and remove foreign matter.

3.2 FIELD QUALITY CONTROL

Electrical materials and devices shall be inspected and tested in accordance with Specification Section 16905, Electrical Testing.

3.3 ADJUSTMENTS

(Not Used)

3.4 CLEANING

3.4.1 Clean and remove all debris, excess material and equipment from the job site after completion of installation.

3.4.2 Clean electrical parts with approved cleaner to remove conductive and deleterious materials.

3.4.3 Clean and repair all steel surfaces damaged during preparation, welding or installation with an approved galvanizing compound in accordance with manufacturer's recommendations and instructions.

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3.5 **PROTECTION**

3.5.1 Seller shall be responsible for receiving, storing and site handling of all Seller furnished equipment and materials.

3.5.2 During installation Seller shall protect from damage all existing facilities, equipment and materials. Existing facilities, equipment or materials which are damaged during the installation shall be repaired at Seller's expense in accordance with contract terms and conditions.

3.6 **DEMONSTRATION**

(Not Used)

3.7 **SCHEDULES**

(Not Used)

END OF SECTION

2810-02446
94320-0183

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION 16110
ELECTRICAL MATERIALS AND DEVICES
B-595-C-B210A-16110

APPROVED FOR CONSTRUCTION

REVISION 1 PER CR-0690 & CR-0929
ISSUE DATE 2/25/93

WAPA	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
QUALITY LEVEL	I	<input type="checkbox"/>	II	<input checked="" type="checkbox"/>
SAFETY CLASS	1	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>
			3	<input checked="" type="checkbox"/>
			4	<input type="checkbox"/>

ORIGINATOR:

CHECKER:

Charles C Simpson 2-25-93
C. C. Simpson, Electrical Engineer Date

A Larsen 2-25-93
A. Larsen, Electrical Engineer Date

APPROVED BY:

K. A. Owrey
K. A. Owrey Lead Discipline Engineer

2-25-93
Date

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SECTION 16110
ELECTRICAL MATERIALS AND DEVICES
B-595-C-B210A-16110

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SECTION 16110
ELECTRICAL MATERIALS AND DEVICES

PART 1 GENERAL

1.1 SUMMARY

This specification section defines the technical requirements for furnishing and delivery of electrical materials and devices for the Vitrification Building foundation.

1.2 REFERENCES

The publications listed below form a part of this specification section to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C80.1 1990 Rigid Steel Conduit

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A312/A312M 1991 Standard Specification for Seamless
and Welded Austenitic Stainless Steel
Pipes

ASTM A403/A403M 1991 Standard Specification for Wrought
Austenitic Stainless Steel Pipe Fittings

ASTM B3 1990 Standard Specification for Soft or
Annealed Copper Wire

ASTM B8 1990 Standard Specification for
Concentric-Lay-Standard Copper
Conductors, Hard, Medium-Hard or Soft

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 1990 National Electrical Code (NEC)

UNDERWRITERS LABORATORIES, INC. (UL)

UL 467 1984 Grounding and Bonding Equipment

UL 514B 1989 Fittings for Conduit and Outlet
Boxes

UL 651 1989 Schedule 40 and 80 Rigid PVC Conduit

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1.3 **RELATED REQUIREMENTS**

Specification Section 16100 Electrical Installation
Specification Section 16111 Conduit Schedule
Specification Section 16905 Electrical Testing

1.4 **DEFINITIONS**

(Not Used)

1.5 **SYSTEM DESCRIPTION**

(Not Used)

1.6 **SUBMITTALS**

Submit the following in accordance with the Vendor Drawing and Data Requirements section of the Order/Subcontract.

1.6.1 Catalog and Manufacturer's Data

Catalog and manufacturer's data shall be submitted for the following:

- A. Conduit
- B. Conduit fittings
- C. Conduit support devices and hardware
- D. Identification
- E. Grounding materials
- F. Conduit anti-seize compounds
- G. Anti-oxidizing compound
- H. Galvanizing touch-up material

1.7 **CLASSIFICATION OF SYSTEM AND COMPONENTS**

(Not Used)

1.8 PROJECT OR SITE ENVIRONMENTAL CONDITIONS

1.8.1 Climatic and Geographic Site Conditions

- A. Site Elevation 714 feet above sea level
- B. Barometric Pressure 14.3 psia
- C. Outside Design Temperature
 - 1) Maximum Design Temperature 110°F
 - 2) Minimum Design Temperature -20°F

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

2.1.1 General

2.1.1.1 When applicable, all electrical materials and components shall be listed by Underwriter's Laboratories and shall bear the UL label.

2.1.1.2 When two or more components of the same specifications are required, the components shall be identical, that is same manufacturer and catalog number.

2.1.2 Conduit

2.1.2.1 Rigid Steel Conduit

Rigid steel conduit shall be in accordance with ANSI C80.1.

2.1.2.2 PVC Conduit

PVC conduit shall be Schedule 80 in accordance with UL 651.

2.1.2.3 Stainless Steel Conduit

2.1.2.3.1 Austenitic seamless stainless steel conduit shall be Type 304L Schedule 40 in accordance with ASTM A312/A312M.

2.1.3 Conduit Fittings

2.1.3.1 Stainless steel conduit ends shall be protected by means of a plastic or 300 series stainless plug or cap.

2.1.3.2 Rigid steel conduit caps and recessed plugs shall be galvanized steel.

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- 2.1.3.3 Conduit union fittings shall be steel, 1/2 inch - 1 inch or steel alloy 1-1/4 inch - 6 inch, with zinc-electroplated finish and in accordance with UL 514B. Appleton UNY and UNF or equal.
- 2.1.3.4 Weld fittings for stainless steel conduit shall be in accordance with ASTM A403/A403M.
- 2.1.4 Conduit Support Devices and Hardware
- 2.1.4.1 Conduit supports unless otherwise noted on the Contract Drawings shall be fabricated of 12 gauge, 1-5/8 inch by 1-5/8 inch, metal framing channels: Unistrut P-1000, pre-dipped galvanized, with Unistrut P-1000 series, electrogalvanized, pipe clamps or equal.
- 2.1.4.2 Conduit clamps shall be malleable iron type with hot-dipped galvanized finish. Appleton Series PC or equal.
- 2.1.5 Identification
- 2.1.5.1 Identification of wall embeds shall be by means of a nameplate. Nameplates shall be 3" x 1" machine-engraved, phenolic with 1/2 inch high black figures on white background. The nameplates shall read in accordance with Specification Section 16111, Conduit Schedule, Attachment B, Embed Number.
- 2.1.5.2 Identification of conduits shall be by means of self-sticking vinyl cloth, black identification on an orange background, as manufactured by Brady Catalog #B-502 or equal. Label shall read in accordance with Specification Section 16111, Conduit Schedule, Attachment A, Raceway. No. Label length shall be as indicated below:

CONDUIT TRADE SIZE	BAND LENGTH	CHARACTER SIZE
3/4" and 1"	8"	1/2"
1-1/2" to 6"	8"	3/4"

- 2.1.6 Grounding Materials
- 2.1.6.1 Grounding Conductors
- 2.1.6.1.1 External building ground loop and bonded connections shall be #500 kcmil bare copper wire in accordance with ASTM B3. Wire shall be Class B concentric stranded in accordance with ASTM B8.
- 2.1.6.1.2 Internal building ground and bonded connections shall be bare copper wire in accordance with ASTM B3 and sized as indicated on the Contract Drawings. Wire shall be Class B concentric stranded in accordance with ASTM B8.

2.1.6.1.3 Single point instrument ground conductor shall be single conductor, stranded copper wire with green Type TW 600 volt insulation. Conductor shall be UL listed, in accordance with the National Electrical Code, NFPA 70 and sized as indicated on the Contract Drawings.

2.1.6.2 Ground Rods

Ground rods shall be copper clad steel, 5/8 inch diameter by 10 feet: Joslyn Number J8340 or equal.

2.1.6.3 Embedded Ground Plates

2.1.6.3.1 Embedded ground plates shall be cast copper alloy body, four holes type and in accordance with UL 467. Cadweld Catalog Number B161-2Q or equal.

2.1.6.4 Ground Connections

2.1.6.4.1 Weld connections between ground conductors or between ground conductors to steel surfaces shall be by the exothermic process type. Cadweld or equal.

2.1.6.4.2 Ground connections to embedded ground plates shall be made with exothermic connection, Cadweld Type TA or equal as shown on the Contract Drawings.

2.1.6.4.3 Ground wells shall be in accordance with the Contract Drawings.

2.1.7 Conduit Anti-Seize Compounds

Anti-seize compounds for threads of rigid steel conduit shall be electrically conductive: Thomas and Betts Co. "Kopr-Shield" or equal.

2.1.8 Anti-Oxidizing Compound

Anti-oxidizing compound for connections of grounding connectors shall be electrically conductive, rust and corrosion inhibitive, Thomas and Betts "Kopr-Shield" or equal.

2.2 FABRICATION AND MANUFACTURE

(Not Used)

PART 3 EXECUTION

3.1 PREPARATION

(Not Used)

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3.2 **INSTALLATION, APPLICATION AND ERECTION**

Materials and devices specified herein shall be installed in accordance with Specification Section 16100, Electrical Installation.

3.3 **FIELD QUALITY CONTROL**

Materials and devices specified herein shall be inspected and tested in accordance with Specification Section 16905, Electrical Testing.

3.4 **ADJUSTMENTS**

(Not Used)

3.5 **CLEANING**

(Not Used)

3.6 **PROTECTION**

(Not Used)

3.7 **DEMONSTRATION**

(Not Used)

3.8 **SCHEDULES**

(Not Used)

END OF SECTION

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION 15062
PIPING MATERIAL, FABRICATION, ERECTION
& PRESSURE TESTING (DOUBLE CONTAINED PIPING)
B-595-C-B210A-15062

APPROVED FOR CONSTRUCTION

REVISION 1 per CR-0929
ISSUE DATE 23 FEBRUARY 1993

WAPA YES ☐ NO ☒
QUALITY LEVEL I ☐ II ☒
SAFETY CLASS 1 ☐ 2 ☐ 3 ☒ 4 ☐

ORIGINATOR:

CHECKER:

Rod Wright 2/24/93
Rod Wright, Piping Engineer Date

Chris Inano 2/24/93
Chris Inano, Piping Engineer Date

APPROVED BY:

Ken Baughman
Ken Baughman Lead Discipline Engineer

2/24/93
Date

Rev. 1

SECTION 15062
PIPING MATERIAL, FABRICATION, ERECTION
& PRESSURE TESTING (DOUBLE CONTAINED PIPING)
B-595-C-B210A-15062

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ATTACHMENTS

<u>ATTACHMENT</u>	<u>TITLE</u>
A	UNDERGROUND PIPE DETAILS

SECTION 15062
PIPING MATERIAL, FABRICATION, ERECTION
& PRESSURE TESTING (DOUBLE CONTAINED PIPING)

PART 1 GENERAL

1.1 SUMMARY

This Section defines the technical requirements for the furnishing, fabrication, erection and testing of Double Contained Piping. Revision 1 of this Specification Section has been checked for completeness in regard to the Foundation Slab only.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

- | | |
|-----------------|---|
| ASME/ANSI B16.9 | 1986 Factory-Made Wrought Steel
Buttwelding Fittings |
| ASME B31.3 | 1990 Chemical Plant and Petroleum Refinery
Piping, Including Addenda a and b |

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- | | |
|-------------------|--|
| ASTM A 182/A 182M | 1990 Forged or Rolled Alloy-Steel Pipe
Flanges, Forged Fittings, and Valves and
Parts for High-Temperature Service |
| ASTM A 234/A 234M | 1990 Piping Fittings of Wrought Carbon
Steel and Alloy Steel for Moderate and
Elevated Temperatures |
| ASTM A 240 | 1991 Heat-Resisting Chromium and Chromium-
Nickel Stainless Steel Plate, Sheet, and
Strip for Pressure Vessels |
| ASTM A 262 | 1986 Detecting Susceptibility to
Intergranular Attack in Austenitic
Stainless Steels |
| ASTM A 312/A 312M | 1991 Seamless and Welded Austenitic
Stainless Steel Pipes |

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ASTM A 403/A 403M 1991 Wrought Austenitic Stainless Steel
Piping Fittings

NATIONAL ASSOCIATION OF CORROSION ENGINEERS (NACE)

NACE RP02-74 1974 High Voltage Electrical Inspection of
Pipeline Coatings Prior to Installation

PIPE FABRICATION INSTITUTE (PFI)

PFI Standard ES-3 1990 Fabricating Tolerances

PFI Standard ES-24 1990 Pipe Bending Methods, Tolerances,
Process and Material Requirements

PFI Standard ES-32 1985 Tool Calibration

1.3 **RELATED REQUIREMENTS**

This specification is to be used in conjunction with the following specifications:

Specification Section 05062 Welding Piping

Specification Section 13252 Precautions for Fabrication,
Handling and Storage of Stainless
Steel and Nickel Alloys

1.4 **DEFINITIONS**

The term "erection," where used in this specification, shall be defined as follows: Shop or field fabricated erection - the placing of any pipe or component of a piping or instrument system in its final position specified in the drawings and/or specifications.

1.5 **SYSTEM DESCRIPTION**

All components, fabrication, erection, and testing, except as otherwise qualified herein, shall be in accordance with the requirements of ASME B31.3.

1.6 **SUBMITTALS**

Submit the following in accordance with Part III, Section I, Exhibit 5 of the Request for Proposal (RFP), Vendor Drawing and Data Requirements (VDDR).

1.6.1 Shop Drawings

Submit shop drawings of nonstandard components per Paragraph 2.1.3A.

1.6.2 Quality Control Submittals

A. Factory Acceptance Tests (FATS)

The following test reports shall include itemized test activities, inspection requirements and functional performance requirements, together with the corresponding acceptance criteria for the tests.

- 1) Submit corrosion test reports for each heat per Note 2 of Piping Material Classes DD and DE.

B. Construction Acceptance Tests (CATS)

The following test reports shall include itemized test activities, inspection requirements and functional performance requirements, together with the corresponding acceptance criteria for the tests.

- 1) Submit Pressure Test Reports per Paragraph 3.3.4.
- 2) Submit cleaning reports per Paragraph 3.5.3.

1.6.3 Certificates

Certified Material Test Reports (CMTRs) for all pressure containing and/or wetted parts.

1.7 CLASSIFICATION OF SYSTEMS AND COMPONENTS

(Not Used)

1.8 PROJECT OR SITE ENVIRONMENTAL CONDITIONS

(Not Used)

PART 2 PRODUCTS

2.1 MATERIALS/EQUIPMENT

2.1.1 Piping Material Classes

- A. Piping Material Classes are listed herein conform to designations as shown on the drawings.

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B. Unless otherwise specified, all pressures and temperatures listed are design conditions.

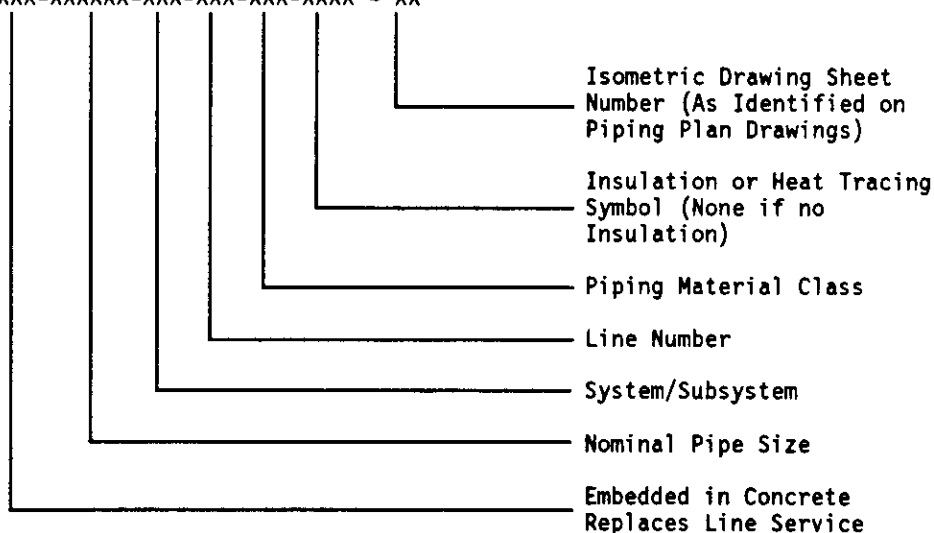
C. Piping Material Classes/Services Index

CLASS	MATERIAL	RATING CLASS	SERVICE
DD	Carrier - 304L SS Containment - 304L SS	300 300	Regulated Drains
DE	Carrier - 316L SS Containment - 316L SS	300 300	Process Regulated Drains (Formic Acid Drains)

D. Identification of Piping

Example:

PE- 3" -520-067- DD-NONE - 01
XXX-XXXXXX-XXX-XXX-XXX-XXXX - XX



Piping Material Class DD

General Material: Carrier and Containment - 304L Stainless Steel
Rating: Carrier - Class 300
Containment - Class 300
Temperature Limit: -20°F thru 450°F
Maximum Pressure: 260 PSIG
Corrosion Allowance: Carrier - .065" (See Note 3)
Containment - None
Construction: Carrier and Containment - Buttweld (except socketweld connections to containment drains)

ITEM DESCRIPTION

Carrier and Containment Pipe (See Note 2)

2" - 8" Seamless stainless steel, schedule 40S, ASTM A 312/A 312M, Grade TP304L, beveled ends.

Carrier and Containment Fittings (ells, tees, laterals, caps, and reducers, See Notes 1 and 2)

2" - 8" Stainless steel, ASTM A 403/A 403M, Grade WP304L-S, buttweld type, schedule 40S.

Containment Self Reinforced
Branch Connections

1/2" - 2" Class 3000 stainless steel, ASTM A 182/A 182M, Grade F304L, socketweld. Bonney Forge Sockolet or equal.

Carrier Branch Construction

Use reducing tees or reducing laterals within the size range of reducing tees per ASME/ANSI B16.9. Use reducing tees/laterals and reducers (or swage nipples) where not within the size range of ASME/ANSI B16.9.

Containment Branch Construction

Use reducing tees or reducing laterals (split and reweld to suit) within the size range of reducing tees per ASME/ANSI B16.9. Use reducing tees/laterals (split and reweld to suit) and reducers (or swage nipples) where not within the size range of ASME/ANSI B16.9.

Carrier Swages

2" - 2" Concentric swage, stainless steel ASTM A 403/A 403M, Grade WP304L-S, schedule 40S, beveled both ends.

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Piping Material Class DD (continued)

Flanges (See Note 4)

- 2" - 8" Plate flange, 304L stainless steel flat face slip-on type, 1/4" thick. Flange drilling to match that of ASME/ANSI B16.5 Class 150 flange.
- 2" - 8" Plate blind flange, 304L stainless steel flat face slip-on type, 1/4" thick. Flange drilling to match that of ASME/ANSI B16.5 Class 150 blind flange.

Gaskets (See Note 4)

- 2" - 8" Class 125 full face red rubber gasket, 1/8" thick. Sepco 20 or equal.

Bolts (See Note 4)

Stud bolts, 304 stainless steel, ASTM A 193, Grade B8 with ASTM A 194 Grade 8S nuts.

Centering Guides

Centering guides shall be made from 1/4" thick ASTM A 240, Grade 304L stainless steel plate.

Notes:

1. Use bends with a radius of 3 nominal pipe diameters (3D) on carrier piping for sizes 2", and fittings on containment piping except where indicated otherwise on the drawings.
2. All carrier piping material shall be corrosion tested per ASTM A 262, Practice A. One test shall be conducted per heat of material. The acceptance criteria shall be passing of Practice A of ASTM A 262, or a measured corrosion rate of less than 2 mils per month per ASTM A 262, Practice C. A test report shall be submitted for each heat.
3. All embedded lines have been checked to ensure an available corrosion allowance of .120 inch minimum on the carrier pipe. New "field addition" embedded lines shall be checked to ensure that available corrosion allowance is a minimum of .120 inch on the carrier pipe.
4. Use these items only at cleanouts for drain lines.

Piping Material Class DE

General Material: Carrier and Containment - 316L Stainless Steel
Rating: Carrier - Class 300
Containment - Class 300
Temperature Limit: -20°F thru 450°F
Maximum Pressure: 260 PSIG
Corrosion Allowance: Carrier - .065" (See Note 3)
Containment - None
Construction: Carrier and Containment - Buttweld (except socketweld connections to containment drains)

ITEM DESCRIPTION

Carrier and Containment Pipe (See Note 2)

2" - 8" Seamless stainless steel, schedule 40S, ASTM A 312/A 312M, Grade TP316L, beveled ends.

Carrier and Containment Fittings (ells, tees, caps, and reducers, See Notes 1 and 2)

2" - 8" Stainless steel, ASTM A 403/A 403M, Grade WP316L-S, buttweld type, schedule 40S.

Containment Self Reinforced Branch Connections

1/2" - 2" Class 3000 stainless steel, ASTM A 182/A 182M, Grade F316L, socketweld. Bonney Forge Socketolet or equal.

Carrier Branch Construction

Use reducing tees or reducing laterals within the size range of reducing tees per ASME/ANSI B16.9. Use reducing tees/laterals and reducers (or swage nipples) where not within the size range of ASME/ANSI B16.9.

Containment Branch Construction

Use reducing tees or reducing laterals (split and reweld to suit) within the size range of reducing tees per ASME/ANSI B16.9. Use reducing tees/laterals (split and reweld to suit) and reducers (or swage nipples) where not within the size range of ASME/ANSI B16.9.

Carrier Swages

2" - 2" Concentric swage, stainless steel ASTM A 403/A 403M, Grade WP316L-S, schedule 40S, beveled both ends.

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Piping Material Class DE (continued)

Centering Guides

Centering guides shall be made from 1/4" thick ASTM A 240, Grade 316L stainless steel plate.

Flanges (See Note 4)

2" - 8" Plate flange, 316L stainless steel flat face slip-on type, 1/4" thick. Flange drilling to match that of ASME/ANSI B16.5 Class 150 flange.

2" - 8" Plate blind flange, 316L stainless steel flat face slip-on type, 1/4" thick. Flange drilling to match that of ASME/ANSI B16.5 Class 150 blind flange.

Gaskets (See Note 4)

2" - 8" Class 125 full face red rubber gasket, 1/8" thick. Sepco 20 or equal.

Bolts (See Note 4)

Stud bolts, 304 stainless steel, ASTM A 193, Grade B8 with ASTM A 194 Grade 8S nuts.

Notes:

1. Use bends with a radius of 3 nominal pipe diameters (3D) on carrier piping for size 2", and fittings on containment piping except where indicated otherwise on the drawings.
2. All carrier piping material shall be corrosion tested per ASTM A 262, Practice A. One test shall be conducted per heat of material. The acceptance criteria shall be passing of Practice A of ASTM A 262, Practice A, or a measured corrosion rate of less than 4 mils per month per ASTM A 262, Practice B. A test report shall be submitted for each heat.
3. All embedded lines have been checked to ensure an available corrosion allowance of .120 inch minimum on carrier piping. New "field addition" embedded lines shall be checked to ensure that available corrosion allowance is a minimum of .120 inch on carrier piping.
4. Use these items only at cleanouts for drain lines.

2.1.2 Pressure Testing Materials

A. Test Water Requirements

Water used for cleaning and/or hydrotest shall conform to Specification Section 13252.

B. Pneumatic Air Requirements

The air for pneumatic testing shall have a dew point of -20°F or less at atmospheric pressure and shall contain less than 10 parts per million oil.

C. Leak Detector Solution

Leak detector solution for pneumatic testing shall be Nupro "Snoop" or equal.

D. Pressure Test Blinds

Plain 1/4" thick stainless steel test blanks made from ASTM A 240, Grade TP304 plate with 1/16 inch thick non-asbestos gaskets shall be used for blanking raised face flanges for sizes up to 6 inches.

E. Pressure Test Plugs

Open ends of piping systems (i.e., plain end or beveled end) that cannot otherwise be blanked off for pressure testing shall be closed off with commercial pressure test plugs suitable for the pipe size and test pressure.

2.1.3 Components

General

The requirements contained in this Section shall apply to all Material Classes included in this specification.

- A. Pipe, fittings, and all other piping components (i.e., valves, strainers, gaskets, bolting, etc.) shall be standard components conforming to the standards listed in ASME B31.3, Appendix E within the size ranges of those standards. Where such conformance is not possible (i.e., fittings smaller than 1/2" NPS, manufacturer's proprietary design, etc.), the Seller shall submit a dimensional drawing of the component, and the component shall be certified by the manufacturer as being suitable for the design conditions of the applicable material class. The Seller shall adjust field dimensions if the materials procured do not correspond to the dimensions depicted on the drawings.

2.1.4 Buried Warning and Identification Tape

Tape shall be an alkali-resistant polyethylene plastic tape manufactured specifically for warning and identification of buried utility lines, and shall be provided in rolls, 6 inches wide with minimum thickness of 0.004 inch and shall have a minimum strength of 1750 pounds per square inch lengthwise and 150 pounds per square inch crosswise. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 feet deep. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. The tape shall be as specified in Table 1 and shall be imprinted in bold black letters continuously and repeatedly over entire tape length.

TABLE 1

TAPE COLOR

Red: Gas, Oil, Dangerous Materials

Warning and identification shall be "CAUTION BURIED (Intended Service) LINE BELOW" or similar wording. Code and letter coloring shall be permanent, unaffected by moisture and other substances contained in the trench backfill.

2.1.5 Corrosion Control Materials for Underground Pipe

- A. Cold Applied Tape Wrap system shall consist of a tape manufacturer recommended primer and a Nomex or equal base cloth and phenolic base resin, and shall be suitable for operation at 340°F. Knight-Laggi 200 System or equal.
- B. High Temperature Cement for packing of voids and repair of coating at exothermic welds shall be a matrix composed primer and chopped fibers of the tape base cloth.
- C. Magnesium ribbon anode shall consist of .135" diameter core wire coated with magnesium in a 3/8" x 3/4" rectangular shape, with a nominal weight of 0.243 pounds per foot. Dow DC-1016 Galvoline or approved equal.
- D. 12 gauge wire for test leads and jumper wire shall be suitable for direct burial, with Type RHW insulation.

2.2 FABRICATION AND MANUFACTURE

2.2.1 Shop Assembly

A. Welding

Welding, weld examination and postweld heat treatment shall be in accordance with Specification Section 05062.

B. Internal Misalignment

Where the ends of piping components are to be joined by welding and the internal surface misalignment exceeds the dimensional limits of the qualified welding procedure, one of the following procedures shall be used to correct this condition.

- 1) Taper bore or grind the wall of the component extending internally using a 4 to 1 maximum taper. Such tapering shall not result in a finished wall thickness, before welding, that is less than the nominal pipe wall thickness minus the manufacturer's mill tolerance. Further reduction of the wall thickness requires Buyer's authorization.
- 2) Use spreaders or internal and/or external lineup clamps to correct moderate out-of-round condition.

C. Cleanliness

Cleanliness requirements for fabrication, handling and storage of 300 series stainless steel piping shall be per Specification Section 13252.

D. Any deviations in dimensions from the drawings shall be submitted to the Buyer in writing, for approval, prior to fabrication of the affected piping.

E. Dimensions on the Piping Plan drawings are in inches when dimensions are less than 1'-0". Feet and inches are shown when dimensions are 1'-0" and more. Dimensions on the Piping Isometric drawings are in inches when less than 2 feet. Feet and inches are shown when dimensions are 2 feet or greater.

F. Dimensions are to the centerline of pipe.

G. Where cold spring (CS) or prespring (PS) is required, the Piping drawings have been adjusted to accommodate this. The piping shall be fabricated to the dimensions shown.

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- H. Reducers are concentric (except for slurry services) unless otherwise noted on the drawings.

2.2.2 Fabrication - Dimensional Tolerances

Pipe fabrication tolerances shall be in accordance with Pipe Fabrication Institute ES-3.

2.2.3 Fabrication - Pipe Bending

- A. Pipe bending shall be in accordance with Pipe Fabrication Institute ES-24. Except, pipe bend post wall thickness shall be no less than 78.1 percent of the pre-bend thickness.
- B. When three diameter bends "3D" are referenced, they are to be fabricated in accordance with the 3D requirements. (The requirements for 3Dn are not to be applied under any circumstance.)

2.2.4 Packaging and Shipping

- A. Preparation for shipment shall conform to the manufacturer's standard, and as a minimum shall provide protection against corrosion and damage from normal handling and storage.
- B. Minimum preparation shall include the following:

All pipe ends shall be protected by means of a plastic (non-PVC) or 300 series stainless steel plug or cap.

PART 3 EXECUTION

3.1 **PREPARATION**

(Not Used)

3.2 **INSTALLATION APPLICATION AND ERECTION**

3.2.1 **Field Fabrication and Erection**

- A. All field fabrication shall conform to the paragraph titled "Fabrication", except that field installation tolerances shall be plus or minus 1/2".
- B. All piping and tubing shall be fabricated and installed in accordance with the Piping drawings.
- C. Coordinates and elevations are used extensively on the Piping drawings. The Seller shall establish the required fabrication dimensions.

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D. Elevations are designated as follows:

Nonsloped lines - "Bottom of Pipe" (BOP EL)
"Centerline Elevation" (CL EL)
"Beveled End Elevation" (BE EL)
"Plain End Elevation" (PE EL)

Sloped lines - "Centerline Work Point Elevation"
(CL W.P. EL)

- E. Piping shall be examined before erection to ensure that all foreign matter has been removed.
- F. The Seller shall be responsible for the proper horizontal and vertical alignment of the piping as shown on the drawings.
- G. The Seller may elect, at his option, to split and reweld secondary containment piping, fittings, anchors, etc.
- H. The Seller shall place buried warning and identification tape conforming to Paragraph 2.1.4 to identify the presence of underground piping at a depth of 12 inches below finished grade or as shown on the Contract Drawings.
- I. Fitting make-up is not dimensioned on the drawings.

3.2.2 Corrosion Protection for Underground Piping

- A. All exposed piping (including stainless steel containment pipe) in underground service shall be protected from exterior corrosion by use of a cold applied tape wrap. Materials, surface preparation, application and inspection requirements shall be in accordance with manufacturer's recommendations.
- B. All buried piping shall be holiday tested, for coating discontinuities, per NACE RP02-74.
- C. Refer to Attachment A for temporary cathodic protection requirements.

3.3 FIELD QUALITY CONTROL

3.3.1 Pressure Tests

- A. The minimum test pressure is the lowest allowable test pressure gauge reading (the calculated test pressure plus the additional pressure resulting from the static head of the test fluid above the test gauge).

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- B. The maximum test pressure shall be the greater of:
 - 1) 1.1 times (1.1x) the minimum test pressure
 - 2) 60 psi greater than the minimum test pressure
 - C. Prior to initial operation, all installed piping shall be tested except where otherwise qualified by this specification.
 - D. Piping that is to be purged after installation shall be tested and all repairs made prior to purging.
 - E. The Buyer's Representative shall be given two working days prior notification of the time and date of any testing to be performed.
 - F. The Seller shall prepare and submit a hydrostatic and pneumatic test procedure, including test diagrams, and test report format.

3.3.2 Pressure Testing of Piping

- A. All pressure testing shall be per ASME B31.3.
- B. All piping systems shall be hydrostatically tested (carrier piping).
- C. The annular space of double contained pipe shall be pneumatically tested with air at 10 psig, meeting the requirements of paragraph 2.1.2.B of this specification.

3.3.3 Pressure Test Preparation

- A. All joints, including welds, are to be left uninsulated and exposed for examination during the test. Joints may be insulated or coated once they have been previously tested in accordance with this specification.
- B. Pressure test gauges shall be calibrated per PFI ES-32. The calibration shall be made using a dead weight tester with calibration records traceable to the National Institute of Standards and Technology. Gauge shall be tagged with the dates of the last and next calibrations. The date of the gauge calibration shall be recorded by the Seller.
- C. The Seller shall furnish the pumps, gauges, measuring devices, temporary plug valves, and other miscellaneous equipment necessary for testing.

- D. The test pressure, minimum duration, and acceptance criteria shall be in accordance ASME B31.3. The following additional requirements shall be included:
- 1) The test pressure shall be applied and maintained for at least five minutes prior to start of minimum test duration to assure that the pressure has equalized.
 - 2) The test pressure shall be maintained for a time sufficient to examine all joints and connections for leakage, but in any case not less than ten minutes. The acceptance criteria is zero leakage.
 - 3) If leaks are found, then
 - their locations shall be marked;
 - the test pressure shall be gradually released;
 - the piping shall be drained;
 - appropriate repairs or replacement shall be made;
 - and the pressure testing shall be repeated until acceptable results have been achieved.

3.3.4 Test Records

- A. The Seller shall prepare and submit to the Buyer test reports for all piping systems requiring tests. The test reports shall contain, as a minimum, the following data:
- 1) Job title and Contract Number
 - 2) Date of test
 - 3) Contract drawing and line numbers identification of piping systems
 - 4) Type of test, i.e., Hydrostatic, Pneumatic,
 - 5) Pressure applied and length of time at Test pressure
 - 6) Test results
 - 7) Test by
 - 8) Signature of Seller Test Supervisor
 - 9) Comments, if any

10) Gauge identification and dates of last and next calibration

11) Signature or stamp of the Buyer's Representative

3.4 **ADJUSTMENT**

(Not Used)

3.5 **CLEANING**

3.5.1 **Cleaning After Hydrotesting**

A. After hydrotesting, the following procedure shall be followed:

- 1) Water used in cleaning austenitic stainless steel and other alloy piping shall conform to Specification Section 13252.
- 2) Flushing velocity shall not exceed 10 feet per second but shall be a minimum of 4 feet per second.
- 3) Piping systems shall be flushed for a minimum of 10 minutes (continuous).
- 4) Visual examination of cleanliness shall be by visual examination of a clean white cloth used to filter the system discharge. Additional 10 minute flushes shall be performed until the visual examination reveals no visible debris collection on the cloth.
- 5) To ensure the absence of moisture after cleaning, lines shall be drained and blown dry. The drying procedure shall be per Specification 13252.
- 6) Immediately after cleaning, drying, and inspection, all non-flanged openings shall be tightly sealed with polyethylene caps to protect the bevel and pipe ends and to prevent the entry of moisture and foreign matter.

3.5.2 **Cleaning After Pneumatic Testing**

After pneumatic testing, piping shall be purged at a minimum velocity of ten feet per second until no foreign matter is seen exiting the pipe. Air quality shall be that specified per paragraph 2.1.2.B of this specification.

Rev. 1

3.5.3 Cleaning Reports

All visual examinations, flushes, and purges shall be documented in a test report to be submitted to the Buyer.

3.6 PROTECTION

(Not Used)

3.7 DEMONSTRATION

(Not Used)

3.8 SCHEDULE

(Not Used)

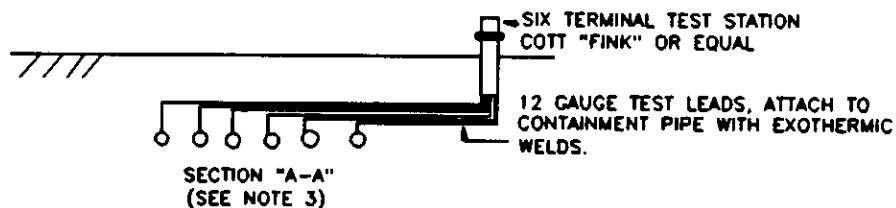
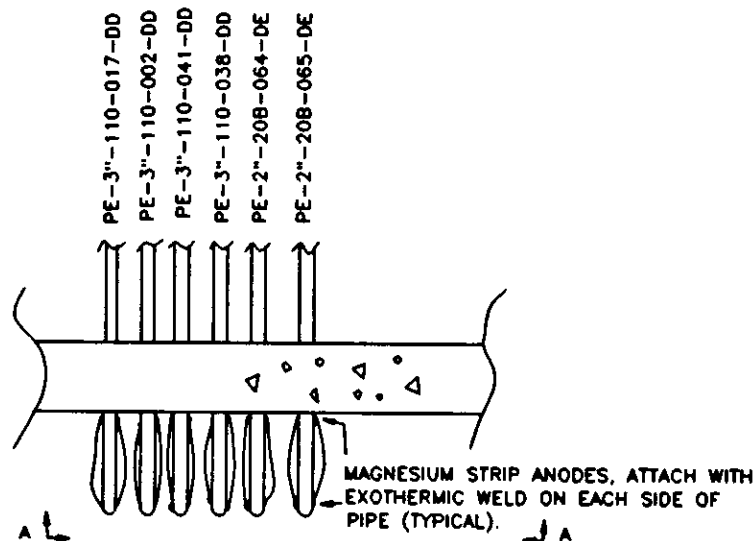
END OF SECTION

Rev. 1

ATTACHMENT A
UNDERGROUND PIPE DETAILS

DETAIL "B"
TEMPORARY CATHODIC PROTECTION DETAIL
FOR LINES LEAVING VITRIFICATION BUILDING SLAB
(SEE NOTES 1 AND 2)

PLAN VIEW



NOTES:

1. COVER EXOTHERMIC WELDS WITH HIGH TEMPERATURE CEMENT PRIOR TO WRAPPING AREA WITH HIGH TEMPERATURE TAPE.
2. REFER TO DETAIL "B" FOR ADDITIONAL REQUIREMENTS APPLICABLE TO INSULATED LINES.
3. LABEL EACH TEST LEAD WITH LINE NUMBER USING COMPUTER PRINTED CHARACTERS ON WHITE HEAT SHRINK SLEEVE, BRADY CATALOG NUMBER B321 OR EQUAL.

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION B210A
RELATED DOCUMENT NO. 1
PIPING ISOMETRICS
B-595-C-B210A-RD-1

APPROVED FOR CONSTRUCTION

REVISION 1
ISSUE DATE 2-24-93

WAPA	YES	<u> </u>	NO	<u>X</u>
QUALITY LEVEL	I	<u>*</u>	II	<u>*</u>
SAFETY CLASS	1*	<u>2*</u>	3*	<u>4*</u>

*See Individual Isometrics

ORIGINATOR:

CHECKER:

G. Van Viegen 2-24-93
G. Van Viegen, Piping Date

G. Barauskas 2-25-93
G. Barauskas, Piping Supervisor Date

APPROVED BY:

K. C. Baughman
K. C. Baughman Lead Discipline Engineer

2/25/93
Date

CMBS B210A PIPING ISOMETRIC INDEX VITRIFICATION BUILDING

DRAWING NUMBER	SHEET NUMBER	DWG REV	REV DATE	LINE NUMBER, CLASS, AND SHEET NUMBER	REMARKS	RD REV
H-2-126175	1	0	11/17/92	PE-2"-20C-159-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126175	2	0	11/17/92	PE-2"-20C-159-A-NONE SHEET 02 PIPING ISOMETRIC		
H-2-126175	8	0	02/10/93	PE-3"-110-017-DD-1h SHEET 01 PIPING ISOMETRIC	HOLD NO. HWVP-FD-240 & 241	1
H-2-126175	16	0	02/10/93	PE-2"-20C-203-A-NONE SHEET 01 PIPING ISOMETRIC		1
H-2-126176	1	0	11/17/92	PE-1"-20C-147-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126176	5	0	02/10/93	PE-2"-20B-065-DE-NONE SHEET 01 PIPING ISOMETRIC	HOLD NO. HWVP-FD-240 & 241	1
H-2-126176	21	0	02/10/93	PE-2"-20C-204-A-NONE SHEET 01 PIPING ISOMETRIC		1
H-2-126177	1	0	11/17/92	PE-1"-20C-148-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126177	22	0	02/10/93	PE-2"-20C-195-A-NONE SHEET 01 PIPING ISOMETRIC		1
H-2-126178	1	0	11/17/92	PE-1"-20C-152-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126178	14	0	02/10/93	PE-2"-20C-197-A-NONE SHEET 01 PIPING ISOMETRIC		1
H-2-126178	17	0	02/10/93	PE-2"-20C-193-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126179	1	0	11/17/92	PE-1"-20C-153-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126179	15	0	02/10/93	PE-2"-20C-196-A-NONE SHEET 01 PIPING ISOMETRIC		1
H-2-126179	16	0	02/10/93	PE-2"-20C-194-A-NONE SHEET 01 PIPING ISOMETRIC		1
H-2-126180	1	0	11/17/92	PE-1"-20C-151-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126180	16	0	02/10/93	PE-2"-20C-199-A-NONE SHEET 01 PIPING ISOMETRIC		1
H-2-126181	1	0	11/17/92	PE-1"-20C-141-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126182	1	0	11/17/92	PE-1"-20C-142-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126183	1	0	11/17/92	PE-1"-20C-143-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126184	1	0	11/17/92	PE-1"-20C-144-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126185	1	0	11/17/92	PE-1"-20C-149-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126185	3	0	02/10/93	PE-3"-110-002-DD-NONE SHEET 01 PIPING ISOMETRIC	HOLD NO. HWVP-FD-240 & 241	1
H-2-126185	22	0	02/10/93	PE-2"-20C-202-A-NONE SHEET 01 PIPING ISOMETRIC		1
H-2-126185	23	0	02/10/93	PE-2"-20C-200-A-1h SHEET 01 PIPING ISOMETRIC		1
H-2-126186	1	0	11/17/92	PE-1"-20C-146-A-NONE SHEET 01 PIPING ISOMETRIC		
H-2-126186	3	0	02/10/93	PE-3"-110-041-DD-1h SHEET 01 PIPING ISOMETRIC	HOLD NO. HWVP-FD-240 & 241	1
H-2-126186	20	0	02/10/93	PE-2"20C-201-A-NONE SHEET 01 PIPING ISOMETRIC		1
H-2-126187	2	0	11/17/92	PE-6"-520-067-DD-NONE SHEET 02 PIPING ISOMETRIC		
H-2-126187	3	0	11/17/92	PE-6"-520-067-DD-NONE SHEET 03 PIPING ISOMETRIC		
H-2-126187	9	0	02/10/93	PE-3"-110-038-DD-1h SHEET 01 PIPING ISOMETRIC	HOLD NO. HWVP-FD-240 & 241	1
H-2-126188	6	0	02/10/93	PE-2"-20B-064-DE-NONE SHEET 01 PIPING ISOMETRIC	HOLD NO. HWVP-FD-240 & 241	1
H-2-126188	18	0	02/18/93	PE-2"-20C-198-A-NONE SHEET 01 PIPING ISOMETRIC		1

I FABRICATION MATERIALS I



PT
NO COMPONENT DESCRIPTION

CARRIER PIPE

1 PIPBAR PIPE SCH 40S SMLS 304L

CARRIER FITTINGS

2 CAPBW CAP SCH 40S 304L SS A4

3 ELLBW ELL 90 DEG LR SCH40S 3
WP304L

4 PIPE ANCHOR 5EA1 PER DWG H-2-

5 PIPE GUIDE 5EG1 PER DWG H-2-124

CONTAINMENT PIPE

6 PIPE BAR PIPE SCH 40S SMLS 304L

CONTAINMENT FITTINGS

7 ELLBW ELL 90 DEG SR SCH40S
304L SS A403 WP304L

8 CAPBW CAP SCH 40S 304L SS A4C

* TRUE LENGTH

FEB 26 1993

QUALITY LEVEL I
SAFETY CLASS 2

Y DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-B6RL10838			
3:7.0.76:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
24/92	PROJECT B-595	FLUOR CONTRACT NO. B457	CWBS NO. B210A		
T REQUIRED		SCALE NONE	BUILDING NO. 1	INDEX NO.	
SHEET 01	OF	DRAWING NUMBER H-2-126175		SHEET 8	OF REV. 0

BILL OF MATERIALS

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DISTRIBUTION CODE: 504

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2/09/93

I FABRICATION MATERIALS I



PT
NO

PIPE COMPONENT DESCRIPTION

1

PIPBAR PIPE SCH 40S SMLS 304L

FEB 26 1993

QUALITY LEVEL II

SAFETY CLASS 3

DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RL10838			
PROJECT TITLE		HANFORD WASTE VITRIFICATION PLANT			
8/93	PROJECT B-595	FLUOR CONTRACT NO. 8457	CWBS NO. 8210A		
REQUIRED	SCALE NONE	BUILDING NO. 1	INDEX NO.		
SHEET 01	OF 01	DRAWING NUMBER H-2-126175		SHEET 16	OF REV. 0

BILL OF MATERIALS

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DISTRIBUTION CODE: 504

PDS MKF
02-03-93

Feb 09 10:24:01 1993 CALMA VILLUM E:ZZB35W06 SPL

I FABRICATION MATERIALS I



PT COMPONENT DESCRIPTION

NO

CARRIER PIPE

1 PIPBAR PIPE SCH 40S SMLS 316L

CARRIER FITTINGS

2 CAPBW CAP SCH 40S 316L SS A4 LENGTH

3 PIPE ANCHOR 5EA1 PER DWG H-2-124

4 PIPE GUIDE 5EG1 PER DWG H-2-12409

CONTAINMENT PIPE

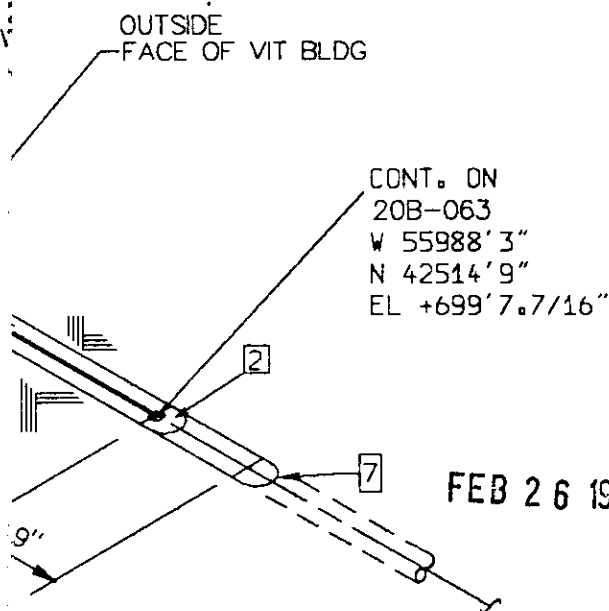
5 PIPBAR PIPE SCH 40S SMLS 316L SS

CONTAINMENT FITTINGS

6 ELLBW ELL 90 DEG LR SCH 40S 316L
A403 WP316L

7 CAPBW CAP SCH 40S 316L SS A403

8 45LBW ELL 45 DEG SCH 40S
316L SS A403 WP316L



QUALITY LEVEL II
SAFETY CLASS 3

Y DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-B6RL10838	
3:7.0.78:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT	
06/93	PROJECT B-595	FLUOR CONTRACT NO. B457	CWBS NO. B210A
OT REQUIRED	SCALE NONE	BUILDING NO. 1	INDEX NO.
SHEET 01	OF	DRAWING NUMBER H-2-126176	SHEET 5
		OF	REV. 0

BILL OF MATERIALS

DISTRIBUTION CODE: 504

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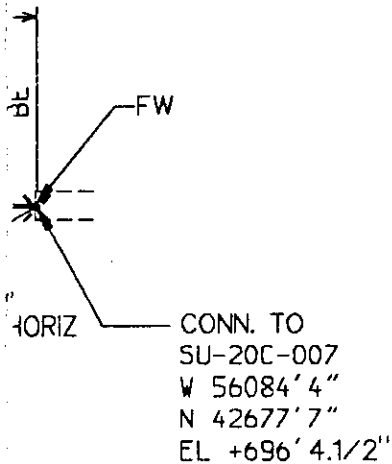
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PIPE COMPONENT DESCRIPTION

PIPE

1 PIPBAR PIPE SCH 40S SMLS 304L



FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

DIVISION	U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RLI0838				
PROJECT TITLE	HANFORD WASTE VITRIFICATION PLANT				
PROJECT	FLUOR CONTRACT NO.	CWBS NO.			
8-595	8457	B210A			
SCALE	BUILDING NO.	INDEX NO.			
NONE	1				
SHEET	OF	DRAWING NUMBER	SHEET	OF	REV.
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BILL OF MATERIALS

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DISTRIBUTION CODE: 504

PDS

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02-03-93

I FABRICATION MATERIALS I



PT
NO

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PIPE COMPONENT DESCRIPTION

1 PIPBAR PIPE SCH 40S SMLS 304L S

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RL10838		
7.0.78:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT		
9/93	PROJECT B-595	FLUOR CONTRACT NO. 8457	CWBS NO. B210A	
REQUIRED	SCALE NONE	BUILDING NO. 1	INDEX NO.	
SHEET 01	OF 01	DRAWING NUMBER H-2-126177		SHEET 22
		OF	REV. 0	

BILL OF MATERIALS

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DISTRIBUTION CODE: 504

PDS

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02-02-93

I FABRICATION MATERIALS I



PT
NO

PIPE COMPONENT DESCRIPTION

1 PIPBAR PIPE SCH 40S SMLS 304L S

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

DIVISION	U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-B6RL10838		
7.0.78:SS	PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT		
/93	PROJECT B-595	FLUOR CONTRACT NO. 8457	CWBS NO. B210A
REQUIRED	SCALE NONE	BUILDING NO. 1	INDEX NO.
SHEET 01	OF 01	DRAWING NUMBER H-2-126178	SHEET 14
			OF REV. 0

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DISTRIBUTION CODE: 504

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2/2/93

I FABRICATION MATERIALS I



PT
NO

COMPONENT DESCRIPTION

PIPE

1 PIPBAR PIPE SCH 40S SMLS 304L S

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-B6RLI0838			
7.0.78:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
/93		PROJECT B-595	FLUOR CONTRACT NO. 8457	CWBS NO. B210A	
REQUIRED		SCALE NONE	BUILDING NO. 1	INDEX NO.	
SHEET 01	OF 01	DRAWING NUMBER H-2-126178		SHEET 17	OF REV. 0

BILL OF MATERIALS

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DISTRIBUTION CODE: 504

PDS MKF 02-02-93

I FABRICATION MATERIALS I



PT
NO

COMPONENT DESCRIPTION

PIPE

1 PIPBAR PIPE SCH 40S SMLS 304L

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RL10B38			
PROJECT TITLE		HANFORD WASTE VITRIFICATION PLANT			
PROJECT		FLUOR CONTRACT NO.	CWBS NO.		
B-595		8457	B210A		
SCALE		BUILDING NO.	INDEX NO.		
NONE		1			
SHEET	OF	DRAWING NUMBER		SHEET	OF
01	01	H-2-126179		15	0

BILL OF MATERIALS

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DISTRIBUTION CODE: 504

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2/2/93

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I FABRICATION MATERIALS I



PT
NO

COMPONENT DESCRIPTION

PIPE

1 PIPBAR PIPE SCH 40S SMLS 304L

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RLI0838			
3:7.0.78:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
1/93	PROJECT B-595	FLUOR CONTRACT NO. B457	CWBS NO. 8210A		
T REQUIRED		SCALE NONE	BUILDING NO. 1	INDEX NO.	
SHEET 01	OF 01	DRAWING NUMBER H-2-126179		SHEET 16	OF REV. 0

BILL OF MATERIALS

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DISTRIBUTION CODE: 504

PDS

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I FABRICATION MATERIALS I



PT
NO

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PIPE COMPONENT DESCRIPTION

1 PIPBAR PIPE SCH 40S SMLS 304L

D WALL

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RL10B38			
PROJECT TITLE		HANFORD WASTE VITRIFICATION PLANT			
PROJECT		FLUOR CONTRACT NO.		CWBS NO.	
B-595		8457		B210A	
SCALE		BUILDING NO.		INDEX NO.	
NONE		1			
SHEET		DRAWING NUMBER		SHEET	
01		H-2-126180		16	
OF				OF	
01				REV.	
				0	

BILL OF MATERIALS

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DISTRIBUTION CODE: 504

PDS MKF 02-02-93

I FABRICATION MATERIALS I



PT NO	COMPONENT DESCRIPTION
<u>CARRIER PIPE</u>	
1	PIPBAR PIPE SCH 40S SMLS 304L
<u>CARRIER FITTINGS</u>	
2	CAPBW CAP SCH 40S 304L SS A4
3	ELLBW ELL 90 DEG LR SCH40S 3 WP304L
4	45LBW ELL 45 DEG SCH 40S 304 WP304L
5	PIPE GUIDE SEG1 PER DWG H-2-12
6	PIPE ANCHOR SEA1 PER DWG H-2-
<u>CONTAINMENT PIPE</u>	
7	PIPBAR PIPE SCH 40S SMLS 304L
<u>CONTAINMENT FITTINGS</u>	
8	CAPBW CAP SCH 40S 304L SS A4
9	ELLBW ELL 90 DEG SR SCH40S 30 WP304L
10	45LBW ELL 45 DEG SCH 40S 304 WP304L

CONT. ON
110--001
W 55988' 3"
N 42507' 9"
EL +699' 8.1/2"

FEB 26 1993

QUALITY LEVEL I
SAFETY CLASS 2

U.S. DEPARTMENT OF ENERGY	
Richland Field Office DE-AC06-86RL10838	
PROJECT TITLE	HANFORD WASTE VITRIFICATION PLANT
PROJECT B-595	FLUOR CONTRACT NO. 8457
24/92	CWBS NO. B210A
SCALE NONE	BUILDING NO. 1
INDEX NO.	
SHEET 01	OF
DRAWING NUMBER H-2-126185	SHEET 3
OF	REV. 0

BILL OF MATERIALS

DISTRIBUTION CODE: 504

PDS

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2/09/93

I FABRICATION MATERIALS I



PT
NO

COMPONENT DESCRIPTION

PIPE

1 PIPBAR PIPE SCH 40S SMLS 304L

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-B6RL10838			
3:7.0.78:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
2/93		PROJECT B-595	FLUOR CONTRACT NO. 8457	CWBS NO. B210A	
T REQUIRED		SCALE NONE	BUILDING NO. 1	INDEX NO.	
SHEET 01	OF 01	DRAWING NUMBER H-2-126185		SHEET 22	OF REV. 0

BILL OF MATERIALS

AFC	77 78 79 80
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DISTRIBUTION CODE: 504

PDS SW 2/09/93

I FABRICATION MATERIALS I



PT NO	COMPONENT DESCRIPTION
---	PIPE
1	PIPBAR PIPE SCH 40S SMLS 304L

16"

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RL10838			
3:7.0.78:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
2/93		PROJECT B-595	FLUOR CONTRACT NO. 8457	CWBS NO. B210A	
T REQUIRED		SCALE NONE	BUILDING NO. 1	INDEX NO.	
SHEET 01	OF 01	DRAWING NUMBER H-2-126185		SHEET 23	OF 23
				REV. 0	

BILL OF MATERIALS

51 52	AFC	77 78 79 80
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DISTRIBUTION CODE: 504

PDS

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01-28-93

I FABRICATION MATERIALS I



PT NO	COMPONENT DESCRIPTION
----------	-----------------------

CARRIER PIPE

1	PIPBAR PIPE SCH 40S SMLS 304L
---	-------------------------------

CARRIER FITTINGS

2	CAPBW CAP SCH 40S 304L SS A4
3	ELLBW ELL 90 DEG LR SCH40S 3 WP304L
4	45LBW ELL 45 DEG SCH 40S 304 WP304L
5	PIPE ANCHOR 5EA1 PER DWG H-2-1
6	PIPE GUIDE 5EG1 PER DWG H-2-124

CONTAINMENT PIPE

7	PIPBAR PIPE SCH 40S SMLS 304L S
---	---------------------------------

CONTAINMENT FITTINGS

8	CAPBW CAP SCH 40S 304L SS A4C
9	ELLBW ELL 90 DEG SR SCH 40S 3C WP304L
10	ELL 45 DEG SCH 40S 304L SS A4C

TRUE LENGTH

FEB 26 1993

QUALITY LEVEL I
SAFETY CLASS 2

Y DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-B6RLIO838			
3:7.0.76:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
24/92		PROJECT B-595	FLUOR CONTRACT NO. 8457	CWBS NO. B210A	
T REQUIRED		SCALE NONE	BUILDING NO. 1	INDEX NO.	
SHEET 01	OF	DRAWING NUMBER H-2-126186		SHEET 3	OF REV. 0

BILL OF MATERIALS

15152	AFC	77 78 79 80
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DISTRIBUTION CODE: 504

PDS SW 2/09/93

Feb 09 12:31:31 1993 CALMA VELLUM E:Z/B3SW10.SPL

I FABRICATION MATERIALS I



PT
NO

--

COMPONENT DESCRIPTION
PIPE

1 PIPBAR PIPE SCH 40S SMLS 304L

FEB 26 1993

QUALITY LEVEL II

SAFETY CLASS 3

DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RL10B3B			
3:7.0.78:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
2/93		PROJECT B-595	FLUOR CONTRACT NO. 8457	CWBS NO. B210A	
T REQUIRED		SCALE NONE	BUILDING NO. 1	INDEX NO.	
SHEET 01	OF 01	DRAWING NUMBER H-2-126186		SHEET 20	OF REV. 0

BILL OF MATERIALS

51.62	AFC	77 78 79 80
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DISTRIBUTION CODE: 504

PDS

SW
2/09/93

I FABRICATION MATERIALS I



PT
NO COMPONENT DESCRIPTION

CARRIER PIPE

1 PIPBAR PIPE SCH 40S SMLS 304L

CARRIER FITTINGS

2 CAPBW CAP SCH 40S 304L SS A4

3 ELLBW ELL 90 DEG LR SCH40S 3
WP304L

4 45LBW ELL 45 DEG SCH 40S 304
WP304L

5 PIPE ANCHOR 5EA1 PER DWG H-2-

6 PIPE GUIDE 5EG1 PER DWG H-2-12

CONTAINMENT PIPE

7 PIPEBAR PIPE SCH 40S SMLS 304L

CONTAINMENT FITTINGS

8 ELLBW ELL 90 DEG SR SCH40S 30
A403 WP304L

9 45LBW ELL 45 DEG SCH 40S 304
A403 WP304L

10 CAPBW CAP SCH 40S 304L SS A4

NT PIPE (TYP)

FEB 26 1993

QUALITY LEVEL I

SAFETY CLASS 2

Y DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-B6RL10838			
3:7.0.76:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
24/92	PROJECT B-595	FLUOR CONTRACT NO. B457		CWBS NO. B210A	
NOT REQUIRED	SCALE NONE	BUILDING NO. 1		INDEX NO.	
SHEET 01	OF	DRAWING NUMBER H-2-126187		SHEET 9	OF REV. 0

BILL OF MATERIALS

DISTRIBUTION CODE: 504

PDS

SW
2/09/93

I FABRICATION MATERIALS I



PT
NO

COMPONENT DESCRIPTION

CARRIER PIPE

1 PIPBAR PIPE SCH 40S SMLS 316L

CARRIER FITTINGS

2 CAPBW CAP SCH 40S 316L SS A4

3 PIPE ANCHOR 5EA1 PER DWG H-2-12

4 PIPE GUIDE 5EG1 PER DWG H-2-12409

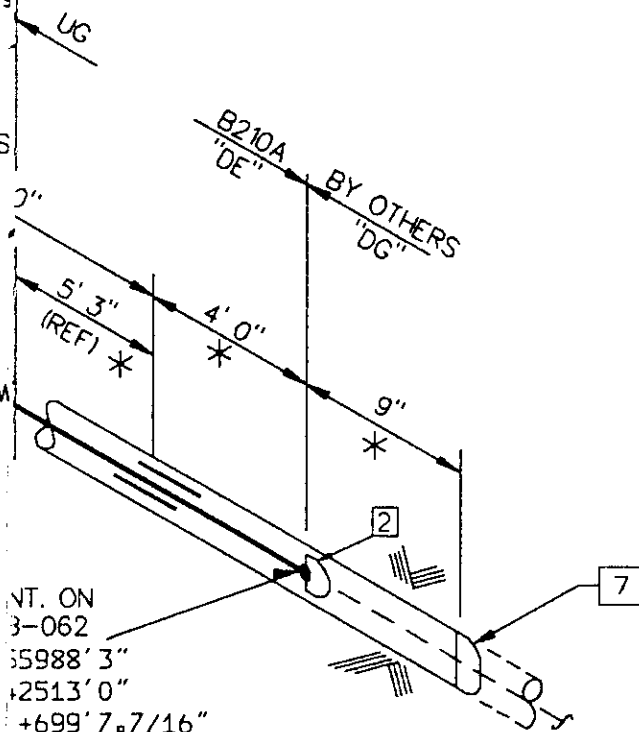
CONTAINMENT PIPE

5 PIPBAR PIPE SCH 40S SMLS 316L SS

CONTAINMENT FITTINGS

6 ELLBW ELL 90 DEG LR SCH 40S 316L
A403 WP316I

7 CAPBW CAP SCH 40S 316L SS A403 W



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3-062
5988'3"
2513'0"
+699'7.7/16"

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

Y DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RL10838			
3:7.0.76:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
24/92	PROJECT B-595	FLUOR CONTRACT NO. 8457	CWBS NO. 8210A		
NOT REQUIRED	SCALE NONE	BUILDING NO. 1	INDEX NO.		
SHEET 01	OF	DRAWING NUMBER H-2-126188		SHEET 6	OF REV. 0

BILL OF MATERIALS

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2/09/93

I FABRICATION MATERIALS I



PT NO	COMPONENT DESCRIPTION
---	PIPE
1	PIPBAR PIPE SCH 40S SMLS 304L

FEB 26 1993

QUALITY LEVEL II
SAFETY CLASS 3

Y DIVISION		U.S. DEPARTMENT OF ENERGY Richland Field Office DE-AC06-86RL1083B			
3:7.0.78:SS		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT			
12/93	PROJECT B-595	FLUOR CONTRACT NO. B457	CWBS NO. B210A		
NOT REQUIRED	SCALE NONE	BUILDING NO. 1	INDEX NO.		
SHEET 01	OF 01	DRAWING NUMBER H-2-126188		SHEET 18	OF REV. 0

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